PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of

Norikazu NIIMI

Group Art Unit: 1742

Application No.: 10/728,956

Examiner: N. MAI

Filed: December 8, 2003

Docket No.: 118002

For: SINTERED BODIES OF YTTRIUM-ALUMINUM GARNET, A METHOD OF PRODUCING THE SAME AND SINTERING AID THEREFOR

REQUEST FOR RECONSIDERATION

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In reply to the March 14, 2006 Office Action, reconsideration of the rejection is respectfully requested in light of the following remarks.

Claims 1-10 and 15-24 are pending in this application.

Applicant appreciates the courtesies shown to Applicant's representative by Examiner Mai during the May 10, 2006 interview. Applicant's separate record of the substance of the interview is incorporated into the following remarks.

I. Allowable Subject Matter

Applicant notes with appreciation that claims 3-10 and 17-24 are in condition for allowance.

II. Rejection Under 35 U.S.C. §103(a)

Claims 1, 2, 15 and 16 were rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over JP 06-107456 ("JP '456") in view of U.S. Patent No. 4,940,678 ("Aitken"). This rejection is respectfully traversed.

The Patent Office alleged that JP '456 teaches a method comprising calcining a powder mixture of Al_2O_3 and Y_2O_3, pulverizing the calcined mixture, molding the pulverized mixed powder and heating the molded product in a nitrogen atmosphere to form a yttrium-aluminum garnet sintered body. The Patent Office acknowledged that JP '456 does not teach or suggest introducing aluminum nitride to the yttrium-aluminum garnet and heating. The Patent Office introduced Aitken as allegedly teaching a nitrogen source could be AlN or Si_3N_4, with AlN being preferred for greater ease of melting compositions having a high Al_2O_3 content. The Patent Office thus alleges that it would have been obvious to one of ordinary skill in the art to either add AlN to the powder mixture before calcining, or after the mixture is calcined and pulverized as taught by JP '456, to form the recited yttrium-aluminum garnet. Applicant strenuously disagrees with the Patent Office's allegations.

Applicant submits that one of ordinary skill in the art would not have combined the teachings of JP '456 and Aitken to achieve the method of producing a sintered body of yttrium-aluminum garnet as recited in claims 1 and 15.

Specifically, Applicant submits that Aitken teaches a very specific rare earth oxynitride glass having SiO_2 in which nitrogen is introduced to achieve high hardness and strength values for such specific glass. See column 1, lines 34-41 and 62-68 of Aitken. As discussed at length during the May 10, 2006 interview, Aitken teaches nitrided glasses having compositions within strictly delimited ranges within the rare earth metal oxide-Al_2O_3-SiO_2 system. See column 2, lines 3-7 of Aitken. In weight percent on the oxide basis, glasses according to Aitken consist essentially of 35-72% rare earth metal oxide, 5-37% Al_2O_3,

20-53% SiO_2, and 4-7.5% N. In mole percent, the glasses according to Aitken consist of 15-40% rare earth metal oxide, 9-50% Al_2O_3, 13-60% SiO_2 and 10-22% Si_3N_4. See column 2, lines 11-21 of Aitken.

Aitken claims that the glass composition includes 20.6% to 37.4% of SiO_2. See, for example, claim 1 of Aitken. Applicants submit that it is clearly not possible to produce any yttrium aluminum composite oxide ceramics as taught by JP '456 from such a silica-containing glass composition.

Aitken thus is directed to a specific glass composition that is completely different from the yttrium aluminum garnet described in JP '456. Aitken teaches a specific composition that is able to retain nitrogen in order to enhance the hardness of that glass composition. As such, nothing in Aitken suggests to one of ordinary skill in the art to have extracted nitrogen from the specific composition and attempted to include nitrogen in the completely different composition of JP '456, or to have done so with any reasonable expectation of achieving any similar results associated with Aitken's specific composition.

Applicant thus submits that one of ordinary skill in the art would not have looked to the specific nitrided glasses with SiO_2 taught by Aitken as providing a teaching or suggestion that aluminum nitride should be added to the yttrium aluminum garnet of JP '456. In other words, Applicant submits that the specific role of nitrogen in the specific system of Aitken does not provide any motivation to use nitrogen in a completely different system, such as that taught by JP '456, with any reasonable expectation of achieving the results taught by Aitken.

Moreover, Applicant submits that an object of Aitken is to improve the hardness of the glass and to lower the melting point of the glass. See column 1, lines 55-57 and lines 65-68 of Aitken. In particular, the glass taught by Aitken can be melted in a range of 1500°C to 1600°C (see column 2, lines 21-23 and column 5, lines 5-9 of Aitken), while conventional glass could be melted at 1700°C (see column 1, lines 55-57 of Aitken). Applicant submits

that the lowering of the melting point of the glass as taught by Aitken cannot be applied to the yttrium aluminum nitride garnet taught by JP '456 because the yttrium aluminum nitride garnet is a ceramic that is not melted during its production.

As discussed during the May 10, 2006 interview, Applicant submits that there is no teaching in JP '456 or Aitken that would have led one of ordinary skill in the art to introduce AlN as a source for nitrogen as taught by Aitken into the teachings of JP '456. Specifically, one of ordinary skill in the art would not have looked to Aitken for a nitrogen source for making an yttrium aluminum garnet as taught by JP '456 or as recited in claims 1 and 15 as Aitken teaches a very specific system that includes a nitrided glass with SiO_2 and no yttrium.

One of the advantages of the method recited in claims 1, 2, 15 and 16 is to improve transmittance of the yttrium-aluminum garnet. See pages 12-14 of the specification. Such an advantage has nothing to do with the advantages obtained by adding AlN to the specific silica-containing glass composition as taught by Aitken. Applicants thus submit that one of ordinary skill in the art would not have looked to the teachings of Aitken to achieve the transmittance obtained by the method recited in claims 1, 2, 15 and/or 16.

For the foregoing reasons, Applicant submits that JP '456 and Aitken, taken in combination or alone, do not teach or suggest all of the features recited in claims 1, 2, 15 and 16. Reconsideration and withdrawal of the rejection are thus respectfully requested.

III. Conclusion

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of claims 1-10 and 15-24 are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,

Leana Levin

James A. Oliff
Registration No. 27,075

Leana Levin
Registration No. 51,939

JAO:LL/rav

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OLIFF & BERRIDGE, PLC
P.O. Box 19928
Alexandria, Virginia 22320
Telephone: (703) 836-6400

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